

REMARKS/ARGUMENTS

Claims 1-51 and 53-63 were pending. By this amendment, claims 1, 9, 12, 14, 17, 27, 29, 38, 45, 49, 53-57, and 61 are amended. No claims are cancelled herein. Thus, following this amendment, claims 1-51 and 53-63 will remain pending for consideration. Applicants aver that no new matter has been added in this response. Claims 1-29, 32-51, and 53-63 stand rejected and claims 30 and 31 are objected to.

In the Office Action, the Examiner:

- objected to the summary section, paragraph [0007], objected to claims 14, 20, 27, 29, 38, and 53 for apparent informalities,
- rejected claims 9-13, 16-20, 24-26, 47, 48, 55, 56, 59, and 60 under 35 USC §112, second paragraph as being indefinite, and indicated that claims 11 and 19-20 would be allowable if rewritten to overcome the §112 rejection,
- rejected claims 53-56 under 35 USC §101 as being directed to nonstatutory subject matter;
- objected to claims 30-31 as being dependent on a rejected base claim, but otherwise allowable if rewritten in independent form, and
- rejected a number of claims over cited references as being anticipated by a cited reference under 35 USC §102(b) and/or as being obvious over one or more cited reference under 35 USC §103(a); in particular rejected:
 - claims 1-3, 7, 8, 14, 15, 24, 26, 27, 35, 38-42, 45-47, 49, 50, and 53-55 as being anticipated by U.S. Patent No. 5,425,050 issued to Schreiber (hereinafter “Schreiber”),
 - claims 1, 7, 12-14, 16, 38-42, 45-49, and 53-56 as being anticipated by U.S. Patent No. 5,917,852 issued to Butterfield et al. (hereinafter “Butterfield”),
 - claims 2, 3, 27-29, 35, 37, 49-51 and 57-63 as being obvious in view of Butterfield,
 - claims 1, 2, 4-6, 8-10, 12-14, 17, 18, 21, 24, 25, 27, 28, 32, 35, 36, 38-47, 49, 50, 53-55, 57-59, 61, and 62 as being anticipated by U.S. Patent No. 6,012,159 issued to

Fischer et al. (hereinafter "Fischer") [the Office Action used a different patent number, U.S. Patent No. 6,278,716, which actually issued to Rubenstein, but Applicants interpreted the rejection as using the Fischer reference cited in this paragraph, and

- claims 1, 2, 4-10, 12-14, 17, 18, 21-28, 32-47, 49, 50, 53-55, 57-59, 61, and 62 as being obvious in view of U.S. Patent No. 6,081,907 issued to Witty et al. (hereinafter "Witty").

As explained below, Applicants submit that the amendments to the specification above overcome the Examiner's objections and the claims, as amended, are allowable over each of the cited references, taken alone or in combination and therefore, each of the rejections of the claims are overcome and they should be withdrawn and the claims allowed.

Objections to the Specification

Applicants have amended the specification and therefore submit the objection is overcome.

Objections to the Claims - Informalities

In the Office Action, the Examiner objected to certain claims for informalities. Applicants have amended the claims and therefore submit the objections have been overcome.

§112 Rejections

In the Office Action, the Examiner rejected certain claims under 35 USC §112, second paragraph. Applicants have amended claim 9 and submit the objections have been overcome with that amendment.

In the Office Action, the Examiner rejected claims 16, 47-48, 55-56, and 59-60 for apparent inconsistencies. Applicants are unclear as to the Examiner's position. The Applicants respectfully submit that the information additive codes and input key generation do not require prior knowledge of what has already been received. Therefore, as the encoding and transmission do not rely on what has been received, generating an encoding transmission using the input keys and output symbols is independent from the receivers receiving and decoding process.

§101 Rejections

In the Office Action, the Examiner rejected claims 53-56 for the term “transmission”. Applicants have amended the claims to more clearly recite the claimed subject matter and therefore respectfully submit the rejection has been overcome.

§102 and §103 Rejections

Claims 1, 14, 27, 38, 45, 49, 53, 57, 61

In the Office Action, the Examiner rejected claims 1, 14, 27, 38, 45, 49, and 53-55 under 35 USC §102(b).

In the Office Action, the Examiner rejected claims using Schreiber, Butterfield, Fischer, and Witty. As explained herein, each of the claims as amended is allowable over each of those references, as they fail to disclose or suggest each element of a claim.

The Examiner states that Schreiber discloses information additive code by broadcasting to a plurality of receivers using coding techniques of FEC, spread spectrum, and OFDM, where the PN sequence generator of Schreiber operates such that the information additive code transmitted at any particular time is independent of the information additive code previously received. Applicants respectfully traverse the rejections.

Schreiber discloses a broadcast system that distributes television video signals to one or more receivers using spread spectrum and OFDM to improve transmission reliability. Schreiber can only reconstruct content associated with transmissions that have been received and cannot reconstruct content for transmissions that have not been received without retransmission.

Schreiber discloses a transmission system that generates two data streams, one analog and one digital, from a single video data stream. The analog data stream undergoes spread spectrum processing via a spread-spectrum encoder which employs pseudorandom PNs of length N to produce a complex analog signal output. The digital signal is processed by a digital encoder to produce a complex digital output. The complex digital signal and complex analog signal are added together to generate hybrid output symbols. The hybrid output symbols are then processed by an OFDM encoder to generate a serial data stream at baseband. The baseband data

stream is shifted in frequency and transmitted by a modulator to one or more receivers at a desired transmission frequency. The receivers reverse the process to decode the transmission.

Claims 1 and 27, as amended, recite in part “wherein when an amount of non-redundant information additive code sufficient to reconstruct the source data has been received, the information additive code receiver(s) reconstruct the source data independent of when, and from which information additive code transmitter(s) the information additive code was received”, claim 49, as amended, recites in part “wherein when an amount of non-redundant information additive code sufficient to decode the source data has been received, decoding the plurality of output symbols into source data, wherein the decoding is performed independent of when, or from which of the information additive code sources the information additive code was received”, and claims 14, 38, 45, 53, and 57 recite in part “wherein when an amount of non-redundant information additive code (output symbols) sufficient to reconstruct the source data have been received, the information additive code (receivers) reconstruct the source data independent of when, or in what order the information additive code (output symbols) was (were) received”, and claim 61 as amended recites in part “wherein after receiving an amount of non-redundant output symbols sufficient to reconstruct the source data, the instruction code to decode the received output symbols decodes the output symbols independent of when, or in what order the output symbols were received”. Schreiber does not disclose or suggest at least these elements.

In Schreiber, if any segment of the transmission is not received (e.g., one or more hybrid output symbols are not received), Schreiber cannot reassemble the video content (e.g., reassemble a missing hybrid output signal) of the lost segment of video transmission from subsequent video transmissions without retransmitting the same data. In other words, a receiver receiving a transmission as disclosed in Schreiber would experience a loss of the video signal content as a result of a complete loss of a segment of the transmission (emphasis added). The spread spectrum, OFDM, and Reed-Solomon techniques disclosed in Schreiber apparently are employed to help transmit the video signal such that the video content that is received can be reproduced even in areas of high cross-talk, multi-path distortion (intersymbol interference), and

noise. Thus, Schreiber can only reconstruct content from received transmissions and cannot reconstruct content for transmissions that have not been received. In addition, coordination between the transmitter and the receivers is implied as the same PN sequence used by the transmitter must be coordinated with the receiver to recover the received transmission.

The Examiner states that Butterfield discloses arrangements of encoding and receiving a wireless transmission using coding techniques of variable FEC where the information additive code transmitted at any particular time is independent of the information additive code received due to the scramble patterns being pseudorandom. Butterfield is not directed to a broadcast system, but rather is directed to a point-to-point communication system which includes a base station independently communicating with individual receivers using a back-channel (reverse link). Butterfield does not disclose or suggest the transmission of the output symbols is done independent of what output symbols a receiver has received as is evident by the back channel.

The Examiner states that Fischer and Witty disclose arrangements for encoding, satellite broadcasting, and decoding and information additive codes where the where the information additive code transmitted or received at any particular time is independent of the information additive code received. Applicants assume, based on the cited textual portion of the references, that the Examiner inadvertently referred to U.S. Patent No. 6,278,716 issued to Rubenstein et al., but meant Fischer (6,012,159). Fischer and Witty show Reed-Solomon encoding schemes that rely on encoding K input symbols to generate N output symbols, where $N > K$. This is a conventional fixed rate ($\text{rate} = K / N$) coding scheme. As is well known in the coding arts, N cannot be too much larger than K because of coding complexities and loss of more than $R = N - K$ symbols prevents complete recovery of the K input symbols.

In such forward error correction (FEC) encoding schemes, the number of output symbols ("N") relative to the number of input symbols ("K") not much larger and is fixed before encoding begins. The number of redundant output symbols, $R = N - K$, is therefore also fixed, so the transmitter needs to know or guess at a loss rate of the transmission link ahead of time. This leads to inefficiencies if the loss rate is overestimated, and can lead to failure to recover input

symbols if the loss rate is underestimated. Thus, due to the estimation process and the need for redundant output symbols, both Fischer and Witty require some redundancy in transmission, which is always the case when the output symbol losses exceed the estimated loss.

In contrast, the claimed output symbol encoding is done so that the information additive code (output symbols) is encoded to be transmitted to the receiver in an order independent of the information additive code previously received by the receiver without requiring redundant transmission. As should be apparent, if the transmission of the information additive code is done independent of what information additive code a receiver received, different receivers having received different information additive code (because of transmission losses or because the receivers started listening at different times) can continue receiving the same stream and have the received information additive code be useful, without the requirement of redundant transmission.

Thus, the Applicants submit that the claims 1, 14, 27, 38, 45, 49, 53, 57, 61 as amended are novel over Schreiber, Butterfield, Fischer, and Witty alone or in combination.

Claims 2-13, 15-26, 28-37, 39-44, 46-48, 50-51, 54-56, 58-60, and 62

Claims 2-13 depend from claim 1, claims 15-26 depend from claim 14, claims 28-37 depend from claim 27, claims 39-44 depend from claim 38, claims 46-48 depend from claim 45, claims 50-51 depend from claim 49, claims 54-56 depend from claim 53, claims 58-60 depend from claim 57, and claim 62 depends from claim 61 and are allowable for at least the same reasons.

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Amdt. dated March 16, 2006
Reply to Office Action of November 17, 2005

PATENT

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



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